



Research Article

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Received: 20 November 2020 / Accepted: 22 March 2021 / Published: 10 May 2021

Pestis: The Collective Challenges of Epidemics

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DOI: <https://doi.org/10.36941/ajis-2021-0059>

Abstract

Currently, COVID-19 is perceived as an epidemic, a new «plague», referring to the matrix metaphor of the pestis expressed in the series contagion – death – fear – isolation. This article aims to understand the multiple collective challenges posed by plague epidemics. The analysis of these challenges may contribute to the reflection on several dimensions that shape the COVID-19 pandemic threat. Individuals interpret the different pasts aiming to solve the problems they face in the present. The collective challenges that the political and medical «management» of the plague place are shaped by circumstantial coalitions of diverse interests, enabling the recognition, demarcation, and legitimisation of actions regarding its public management and control, materialised in concrete health policies, such as the development of several specific devices (isolation, health cordons, lazarettos, quarantine), thus intervening in the configuration of «collective management» of epidemics.

Keywords: *pestis, epidemic, contagion, «collective management» of plagues*

1. Introduction

Currently, COVID-19 is perceived as an epidemic, a new «plague», referring to the matrix metaphor of the *pestis* expressed in the series contagion – death – fear – isolation. Since Classical Antiquity, the term *pestis* has named and classified diseases perceived as contagious and with high mortality. Epidemic, which concerns a disease that suddenly strikes a large number of people and can cause a large number of deaths, has a meaning very close to the Latin word *pestis*. The term «epidemic»

expresses a scholarly form of designation of the social phenomenon that was named *pestis* (Teixeira, 1998).

The social interpretation of reality based on the difference between the past and the future, which characterises modern societies, is related to the ability to choose a past or a future, ascribing time a dimension of openness, of possibility (Luhmann, 1982). In this sense, the past and the future, as representations, may be understood from a present situation (Mead, 1980; Carmo, 2006). The social memory of plagues expresses the various processes by which the past is constructed and reconstructed in each present and each social context (Fentress & Wickham, 1992). Plagues and their memories have a «delirious» nature, in the sense that the languages that establish and represent them detach themselves from their material referent and create another disease, a kind of symbiotic being in which the traits of the biological phenomenon intertwine with those of culture. The establishing nature of language and collective imagination ends up converting the memory of the past into historical narratives, marking the present and projecting the future (Tronca, 2003; Foucault, 2001).

The contagion-epidemic dyad shapes the discourses and representations about plagues (Ferreira, Serpa, Sá, & Martins, 2020). The «doxographic» discursive records produced on the medical notion of contagion express mnemonic linearity, an intention to build a narrative that emphasises the uninterrupted continuity of the idea of contagion (Ferreira & Serpa, 2000). However, the genesis and primordial use of the notion of contagion did not have a medical origin and meaning. The idea of contagion thrived with a strong moral connotation, which describes the possible spread of evil, more than the disease (Fossier, 2011). In the West, until the 13th century, the topic of moral contagion developed in a theological context (contagion of sins, vices and heresies), with no explicit reference to the contagionism model produced by medicine, albeit the diverse *pestis* were associated with the rupture of the established moral.

The plague can be approached by speaking of an epidemic, in the sense of spreading between individuals (Zylberman, 2012), with massive visibility in medieval Europe. It has a double meaning, that of contagion and that of outbreak: on the one hand, a virulent power of multiplication and dispersion *on*, and, on the other hand, a presence, an *internal* concentration (Bargès, 2008). The Greek term *epidemic* initially meant «permanence», «presence in a place», and was given a particular meaning in the medical vocabulary of antiquity, particularly in the Hippocratic and Galenic texts. Since then, the notion of epidemic has contained two central elements of its current content, the permanence of the disease, i.e., its entry into a country or its unusual exacerbation, and simultaneously affecting a significant number of individuals, all living in the same place, by affections with similar symptoms. However, ancient physicians did not associate the idea of spread by contagion with the notion of epidemic, as is often (but not always) the case in modern definitions (Huard & Grmek, 1977; Logie & Turan, 2020; Lazzari et al., 2020). Thus, the etymology of the Greek term «epidemic» has two components: *epi* «over» and *we have given «people», something* that collapses «over» the «individuals», something that occurs in a given place, something that circulates among the «individuals» of a given place, region or country. Here, a sense of visitation stands out: something that extends over those «individuals», something that is in that place, but fundamentally something that arrives, something that, in a normal situation, is external to it, foreign, strange: an outsider, a rain, a disease or a war (Teixeira, 1998).

The term «plague», which has been widely used until the 17th century, regarded all the major epidemic diseases that plagued Europe on a recurring basis, but in which bubonic plague was the central disease of epidemic systems (Fabre, 1998; Bourdelais, 2003). The term «bubonic» regards swollen buboes or lymph nodes. From the emergence of the bacteriological paradigm, the bubonic plague is primarily seen as a rodent disease that is transmitted from mouse to mouse by fleas that usually infest them. The bubonic plague only infects humans if fleas migrate from rodents to humans or from one already infected human being to another. Under certain circumstances, the infection takes the form of pneumonia, which does not require a flea bite to infect the human, and can be transmitted directly from one individual to another by breathing or contact. Both forms coexist in pandemics, but it is the pneumonic type that produces very rapid and extensive spread, a higher case incidence and a

higher mortality rate (Cartwright & Biddiss, 2003).

This positioning expresses a synthetic approach; the study of diseases does not focus only on an analytical approach – examining separately the history of isolated diseases or groups of related diseases – but favours the interconnection of diseases. The frequency of each disease depends on the frequency of other diseases in the same population, at a given time and space. This modelling of the interactions between different diseases (infectious, chronic, acute and contagious, among others) expresses pathocenosis (Grmek, 1983).

Any pathogenesis includes «dominant» and «recessive» diseases. Thus, in each community, there is a large number of rare (recessive) diseases and a small number of common (dominant) diseases. The «dominant» nature of a given disease concerns its high degree of morbidity, as well as the negative consequences in terms of public health and the resulting quality of life. When ecological conditions are stable, any pathogenesis tends towards a state of equilibrium. However, this state can be abruptly modified by exogenous factors (e.g. technical progress, population mix) or endogenous factors (e.g. genetic drift, recombination), generating a «rupture of the pathocenosis» (Grmek, 1983). It is possible to identify four major pathocentric ruptures: in the upper Neolithic, with the transition to a sedentary way of life; in the Middle Ages, with the migrations of peoples from Asia; in the Renaissance, with the discovery of America; at present, with the global unification of the group of pathogenic germs and the sharp fall in most infectious diseases (Méthot, 2016).

Three major periods can be identified in the history of plague epidemics, each corresponding to a pandemic. The first pandemic, called the Justinian Plague, affected the countries of the Mediterranean basin between the 6th and 8th century of our era, having progressed through large and successive outbreaks along the trade routes. The demographic consequences of these successive epidemic outbreaks were significant; the population of the West recorded, in the 7th century and the first half of the 8th century, its lowest level since the High Roman Empire. This decline had significant financial and political implications in countries where the economy was widely based on tax revenue. It may also have conditioned population movements towards areas that were largely unpopulated and, in some cases, incited revolts or invasions (LeGoff & Biraben, 1969). The plague has left the West for six centuries, and the possible reasons for its extinction remain enigmatic (Audoin-Rouzeau, 2003).

The second plague pandemic, which began in the 14th century, was a cataclysm that hit West Asia, the Middle East, Africa and Europe. It was characterised by the long duration and the inescapable progression of the disease, causing catastrophic human losses in rural and urban territories. The widespread epidemic outbreak of the years 1347-1352 has been named the Black Death. To note that, while several terms emerge in contemporary discourse records of the epidemic – such as «pestilence», «great plague», «black death» or «terrible disease», the expression «Black Plague» (*pestis atra*) was used in literary sources only several centuries after its occurrence.

The spread of the epidemic began in China around 1331. It is estimated that, between 1331 and 1393, a third of its population perished, going from around 125 million to approximately 90 million inhabitants. Around 1338, the plague hit the highlands of central Asia. From this region, the disease progressed through the traditional trade channels between the East and the West towards the Mediterranean and Europe (Barry & Gualde, 2008). The spread of the plague took place in two ways: sea, quickly spreading to large geographical areas; and land, from the coast to the interior more slowly. The plague epidemic hit Europe, which was undergoing a situation of crisis. For many countries, it was just the paroxysm of a series of calamities. This widespread epidemic outbreak that took place from 1347 to 1352 was responsible for an unprecedented demographic depression. Current estimates, based on the study of parish records, point to a mortality rate of 25% to 60% of the European population (Kacki, 2016; Benedictow, 2004; Barry & Gualde, 2008). The plague persisted for about four hundred years, either endemic or explosive, resurfacing through periodic outbreaks. The West, once again, forgot the plague. At the end of the 19th century, the plague started to be perceived as a historical disease (Audoin-Rouzeau, 2003).

The third pandemic, which originated in China at the end of the 19th century, experienced rapid and global expansion, favoured by steam navigation and the intensification of international exchanges.

It reached Canton and Hong Kong in 1894, after which major outbreaks occurred. Between 1894 and 1903, the maritime connection between several countries allowed the plague to enter dozens of harbours on various continents. This third pandemic, which lasted from 1894 to 1945, had new characteristics. It reached continents and territories that the previous pandemics left free: the New World, Africa, Madagascar, Australia and Japan. It is important to underline that, while the plague reached almost all harbours in Europe between 1894 and 1910, this spread was followed by a totally different geographic evolution in Europe and the rest of the world. In the regions not affected by the plague during the second pandemic, its spread during the third pandemic took place from the coast to the interior, namely in the New World and Africa. In turn, the evolution of the plague in Europe during the third pandemic was entirely different. There was a harbour spread, about a hundred cases, between 1900 and 1910, but there was no implantation in European territories, as if they had been «inoculated» by the second pandemic (Audoin-Rouzeau, 2003).

From 1905 onwards, the international spread of the plague was largely restricted by the increased surveillance of harbours, the inspection of ships and the isolation of persons and goods affected by the disease. Due to new public health reforms and the introduction of antibiotics in 1950, mortality and the number of cases decreased. However, this pandemic has established several enzootic plague outbreaks on almost all continents. One of the features of plague epidemics is their ability to «shut down» for years and re-emerge suddenly, in the form of an epidemic.

The central objective of this article is to understand the multiple collective challenges posed by the plague, moulded by circumstantial coalitions of distinct interests that shape the different stances and discursive records produced by diverse agents from different social spaces on the process of «collective management» of epidemics. The analysis of these challenges may contribute to the reflection on several dimensions that shape the COVID-19 pandemic crisis, which are developed in the conclusion of this article.

2. Methods

The methodology followed in this article is of the intensive type. It is about understanding the multiplicity of dimensions that characterise the numerous collective challenges posed by epidemic plagues. To fulfil this goal, a documentary search was carried out on the RCAAP platform (Open Access Scientific Repositories of Portugal) and on the SCILIT database (www.scilit.net), which indexes scientific material from CrossRef and PubMed.

Documentary analysis was the technique used in this research, developed from different types of documentary sources, such as medical journals, handbooks, academic theses and articles produced in the medical field and the social sciences fields, albeit the scientific articles produced on this topic within the scope of social sciences have been favoured. The authors deem that the article is the central formal means of the process of scientific production and communication, accounting for the researchers' scientific activity, where argumentative persuasion strategies are developed, and the interpretative principles favoured by the authors and legitimised by the peers are put forward.

In these documents, language is used to build an «official» reality based on categorisations that produce the promotion or marginalisation of ideas; the dominant conceptual frameworks, in a selective way, define the situations and shape the readers' preferences, perceptions and cognitions (Carvalho, 2000; Ramos, 1981; Kaptein, Meulenberg, & Murray, 2019).

3. From Air, Organism and Soul Corruption to *Pestis* Germ Infection

Air and organism putrefaction were pointed out as causes of the plague, according to the Galenic-Hippocratic system, which was dominant in medicine until the 18th century. This system emphasized the environment and moods as the central elements in the interpretation of diseases. Health resulted from the balance (*eucrasia*) in the combination of the primary qualities – hot, cold, dry and humid – related to the four elements – air, water, earth and fire – and to the four moods – black bile, yellow bile,

blood and phlegm. The disease arose when there was a change in its proportions, leading to a general state of imbalance (*dyscrasia*), which the environment could affect or influence. The Hippocratic-Galenic tradition postulated a continuous structure between health and illness, where each individual was located. Health was «an unattainable ideal» and most people oscillated «forever, between health and illness». Excess of one mood or lack of another could generate disease, as could «corruption» or «putrefaction» of one or another body mood. Any change in the nature of the mood posed a danger to the individual. Even minimal fluctuations required an expeditious reaction to avoid an illness. Standardized and preventive therapies depended on the readjustment of the detected imbalances, forcing the drainage of a mood that had greatly increased or had become corrupt, resorting to bleeding, purging, vomiting or establishing «artificial outlets» (for example, wounds). In humoral medicine, prevention (or prophylaxis) was as important as treatment (or therapy).

In the plague, there was an imbalance between the relative quantities of the first four qualities, and the resulting disharmony was due to an excessive preponderance of hot and wet qualities. The heat and humidity, which were too relative, led to putrefaction and the plague was born. The air could be corrupted through two types of causes: celestial and terrestrial. The celestial causes acted, under certain conditions, on the Earth, causing vapours to detach from it and increase the humid quality of the air. Among these were predominantly fearsome eclipses, planet conjunctions and the particularly evil influence of Saturn. In the medical faculties of Paris and Avignon, it was argued that the Black Death had its origin in the conjunction of Saturn, Jupiter and Mars, which occurred on March 24, 1345. Regarding terrestrial causes, besides certain meteorological conditions, such as seasons, hours of the day, cardinal points and wind directions, the outbreaks of rot were also counted. The corruption of the organism could have its own origin, based on the imbalance of the harmony of humoral qualities, or be provoked or accelerated either by the inhalation of pestilent air or by the entrance of evil through the pores (Roque, 1979).

In addition to medicine, which maintained that the cause of the plague was «air corruption in its substance and qualities», where exposure to harmful air depending on the location and individual predispositions explained the selectivity of the disease (Jacquart, 2001), other concepts, clearly dominant, associated the plague with evil and divine punishment of sinners. The plague was seen as a demonic emanation in which the *diaboli family* (Fabre, 1998) consisting of beggars, vagabonds, Jews, «lepers», prostitutes, gravediggers, «undertakers» and various animals (dogs, cats, rats, worms, caterpillars, locusts, beetles) were the «sowers of evil».

The epidemic, synonymous with disease – the plague –, which was associated with eschatological fear, the fear of an avenging God, the power of the «devil's family», was seen as the configuration of evil, dominant until the 18th century and which continued to endure even after its disappearance, enunciated a strongly hierarchical society, which was founded on a clericalisation, particularly affirmed by the Counter-Reformation. The plague thus emerges as a disorder in the natural and, therefore, divine order, which had to be restored. The plague was associated with eschatological fear: of an avenging God, the Devil's agents and omnipresent death. The Church seeks to channel and Christianise this popular belief by providing its explanation: the epidemic is the manifestation of God's anger at the sins of men; the designated adversary is Satan. It is reiterated that the plague and the other scourges that afflict suffering humanity are less to be feared than the devil and sin, for the death of the body is less terrible than that of the soul. Providing the only explanation then possible and effective, the Church's pedagogy overlaid theological fear with irrational and collective fear; it also developed a work of consolation, inasmuch that ecclesiastical mediation and penance allow redemption and hope for the salvation of the soul. The resources were prayer and penance. The actions undertaken were twofold: those of individual mysticism, responding to the need for personal contact with God – to which the institutional forms of Christianity ascribe little space – when they were not even suspected of deviation; and collective invocations. Following the excesses of the medieval flagellants, the Catholic Counter-Reformation framed these devotions: the building of chapels, the cult of the patron saints (St. Roque and St. Sebastian, essentially), ex-vows; and processions, sometimes forbidden for fear of spreading the plague (Hildesheimer, 1993).

Beggars and vagabonds were driven out of the cities; Jews and leprosy patients, perceived as «potential culprits», were segregated and often burned; dogs and cats were slaughtered (thousands of dogs and cats were butchered during the 1665 plague in London); bishops cast anathemas on insects and other animals considered to be promoters of the plague. Marginalisation was, therefore, a social production that found its origin in the basic structures of society, work organisation and the dominant value system from which places are divided and hierarchies are founded, ascribing each one their own social dignity or indignity (Castel, 1996). Populations whose ways of life were clearly stigmatised in a type of society characterised by the permanence of statutes, the rigidity of hierarchies and the difficulty of giving way to mobility and change, had several common features. One of them was their exteriority regarding the heritage and regulated work, which condemned them to live on expedients and, in the first place, on begging. Another feature was the uncontrolled mobility of these populations, which exposed them to vindication (Castel, 1996).

3.1 The Plague Germ

When the plague epidemic broke out in Hong Kong in 1894, French authorities in Indochina sent Dr Alexandre Yersin, a member of the Pasteur Institute in Paris, to the English colony to analyse the nature of the disease, the conditions under which it spread. This intervention also aimed to prevent contamination of the populations in the French colonies. Also, Shibasaburo Kitasato, a Japanese physician, graduate from the University of Berlin under the influence of Robert Koch, was sent to the site, as the leaders of Japan, a rising imperialist power, feared that the disease might reach their harbours.

The identity of the plague was reconstructed from the time when Alexandre Yersin and Shibasaburo Kitasato separately claimed that the disease was caused by a bacillus. *Pasteurella pestis* was the agent causing the plague. While Yersin and Kitasato identified the germ responsible for the plague, the French doctor recognised the role of rats in the transmission of the disease. Four years later, Paul-Louis Simond, also a microbiologist at the Pasteur Institute, identified the importance of fleas as vectors for disease transmission, both among rodents and between rodents and humans. The «priority controversy» highlights not only the scientists' desire for acknowledgement of a scientific breakthrough but also a central scientific opposition in the field of bacteriology and microbiology.

By the middle of 1870, a firm ground of knowledge and technique had been reached for the further study of bacteria and the diseases they caused (Rosen, 1993). This knowledge and techniques developed over the following two decades, essentially from two perspectives. Koch and his collaborators gave priority to methodological rigour, expressed in the set of rules and procedures that make up the «Koch postulates», new experimental techniques in the cultivation and study of bacteria, also promoting an «epistemological awareness», translated by the introduction of the «necessary causality» in the explanation of the disease. Pasteur and his collaborators, besides the study of germs, developed the production of vaccines and serums for the prevention and treatment of contagious diseases (Fantini, 1999). According to Mendelsohn (1996), the difference between the Pasteurian concept of disease as a possible «result of a struggle for life» and the concept of disease as «the effect of a cause» advocated by Koch, marks the great difference between these two researchers. This controversy around the development of bacteriology and microbiology allows identifying the role of imperial expansion in the 19th century, the struggle between the French and German empires, symbolically represented by Pasteur and Koch, respectively, the development of the military metaphors of the disease and the contribution of Catholicism's heritage to medical knowledge (Fleck, 1979). The consequences of this position are that there are only classification schemes, specifically historical, which are the product of human interaction (Fleck, 1979; White, 1991).

The plague bacillus called *Pasteurella pestis* is now called *Yersinia pestis* in honour of the French doctor. The genus *Pasteurella* included other strains: *Pasteurella multocida*, *Pasteurella pseudotuberculosis* and *Pasteurella tularensis*, which caused pasteurellosis (*haemorrhagic septicaemia*), pseudotuberculosis and tularaemia, respectively. *Pasteurella pestis* is a zoonotic bacterium found in

small mammals and the fleas that parasite them. Humans are considered accidental hosts that do not contribute to the natural cycle of the disease and may be contaminated by the bite of infected fleas, by direct contact with infected body fluids or contaminated materials, and by the inhalation of respiratory droplets from patients with pneumonic plague (Sexton, 2011). Human migrations, trade and war are factors that promote the spread of the disease. The flea becomes infected by feeding on a bacterial host. In it, *Yersinia pestis* colonises the middle intestine, replicates and creates a blockage of the intestine that prevents the passage of food. Hungry, the flea aggressively seeks food. Due to the blockage, the aspirated blood is regurgitated, transporting the bacteria and introducing them into a new host. They then induce an inflammatory response at the inoculation site and progress via the lymphatic system to the regional ganglia (Sexton, 2011).

It is possible to categorise plague strains into three varieties. The most common, called «*Orientalis*», currently found in Asia (India, Burma, Vietnam, Thailand, Cambodia), Africa (South Africa, Madagascar) and America (United States, Bolivia, Brazil, Ecuador, Peru), could have been responsible for China's last pandemic at the end of the 19th century. Another variety is found in Central Asia, called «*Medievalis*», which could have been at the origin of the 1348 Black Death and the epidemics of the following centuries. The third variety, called «*Antiqua*», is located around the African Great Lakes and could have originated the epidemics of the Antiquity and the High Middle Ages. These three varieties are pathogenic for humans. Although all plague bacilli are toxic to humans, this toxicity varies from one strain to another.

Each of these strains was considered to be responsible for each of the three plague pandemics, but recently another position in the epidemiology of the disease has developed. Multidisciplinary teams showed, from archaeological excavations of mass graves of people affected by the plague in France and from palaeomicrobiological analyses, that only the *orientalis* strain seemed to have sufficient potential to generate a pandemic (Barry & Gualde, 2008). To reach this conclusion, the researchers developed a new method of amplification and genetic characterization applicable to the old DNA [deoxyribonucleic acid]. This technique, called MST (*Multispacer Sequence Typing*, a genotyping technique applied to *Yersinia pestis*), is based on decoding some un-coded areas of the genome and requires a very small amount of DNA. These results are deemed paramount, insofar that, on the one hand, outbreaks of the plague persist in different parts of the world, and, on the other hand, the plague is one of the most studied diseases as a bacteriological weapon (Barry & Gualde, 2008).

The epidemiological work carried out by Marcel Baltazard in India, in the Near and Middle East, led this author to equate the notion of an epidemic. He sustained that the term «epidemic» had become too narrow, proposing the term «anademia» to characterise the situation in India and Java, as well as in all regions affected by the plague, but without the presence of the vector agent, *Pulex irritans*. The term «anademia» meant all modalities that resulted only from the addition of cases with no direct contamination link between them. If the anademic plague remained strictly associated with the murine plague and the spread of infected *X. cheopis*, the resulting plague epidemic was linked to inter-human infection, either direct to lung plague or indirect through human parasitism (Mollaret, 1972). This neologism, first enunciated in 1959, then by WHO (World Health Organisation) in 1960, would often be employed by researchers and physicians. Today, the terms «epidemic» and «anademia» are used to differentiate between two types of infectious attacks: if the disease is contagious and is transmitted from one individual to another, such as influenza or smallpox, it is an epidemic. If the disease is not contagious, such as botulism and tetanus, and there is an addition of cases, it is an «anademia». Certain types of infectious diseases, such as the plague, associate two characteristics: anademic (multiple transmissions to different victims by rat fleas in several places) and epidemic (transmissions from person to person by infected fleas) (Audoin-Rouzeau, 2003).

4. Collective Challenges of *Pestis*

The establishment of administrative and sanitary devices for the «collective management» of epidemics, for their surveillance and prevention, was critical in the institutionalisation of public health

(Fassin, 2000; Barroso, 2019; Lonappan, Golecha, & Balakrish Nair, 2020; Almeida, Sobreira, Leal, & Tavares, 2020). Until the end of the 18th century, early 19th century, public health, as a sociological reality, i.e., with its values, standards and institutions, was essentially limited to technical application and administrative practice: it was a matter of developing isolation, control, surveillance and sanitation measures, according to generally simple protocols, supported by more or less constraining devices. From that period on, public health – although the terms used were public hygiene and political medicine – had the ambition to be a scientific discipline and a «moral philosophy» (Fassin, 2000, p. 64).

The «collective management» of the plague was embodied in a set of procedures and specific institutions: health councils, cordons sanitaires, quarantines, and lazarettos, which were the first preventive administrative and health structures, coordinated by the central government, although initially of a provisional nature. They first developed in the States of Northern Italy in the 14th and 15th centuries, and then spread to the various European States over the following centuries. On March 30, 1348, the Serene Republic of Venice created, for the first time in the West, a health council composed of three nobles to work *pro conservatione sanitatis* (for the preservation of health), which established regulations or expanded to preserve the health of the population (Viallon, 2008; Bonastra, 2010).

These measures stem from the perceptions and representations of a great danger underlying the contagion-epidemic dyad that shapes the plagues (Ferreira et al., 2020). The belief in the contagion of epidemic diseases and events perceived as dangerous can be identified with the symbolic dimension of the impurity that expresses the dangers incurred by the social order and the impurity/purity of a group, emerging as a guarantor of the avoidance of any physical and social proximity with patients and other individuals classified as dangerous in a given community. This articulation between impurity, purification and interdiction of contact due to the belief in contagion is the symbolic management of internal and external dangers that threaten the diverse societies in different time-spaces (Douglas, 1991).

Thus, the literal or metaphorical use of the notion of contagion made it possible to qualify the distribution of a medical and/or social phenomenon characterised by its modalities of expansion, transmission and distribution, by an exponential speed of propagation, associated with an unexpected origin and an unpredictable end. The perceptions of contagion, on the one hand, expressed fear, vulnerability, ignorance and impotence; on the other hand, they led political agents to develop alert procedures and preventive devices. The discourses on contagion embody the normative justifications developed by the institutions to formulate and implement coercive measures, namely, excommunication, quarantine and isolation (Coste, Minard, & Robert, 2011).

The term *quarantine* (from the French *quarantaine*) derives from the word *quadragesima* and from the Italian *quaranta*, ascribed to the forty days isolation period of passengers and cargo on ships, imposed by the authorities of a harbour if there was a suspicion that there were carriers of infection among passengers or crew. The value of 40 days ascribed to the name of the practice – quarantine – would have originated in Ancient China, when, in the early days of the practice of smallpox vaccination, it was possible to observe that the crusts extracted from those affected by smallpox remained infected, about 40 days during winter and only 20 days in summer (Santos & Nascimento, 2014). This daily observation would have led to diverse cultural practices, aimed at purifying or containing the spread of diseases deemed contagious (Kilwein, 1995).

The instruments of quarantine were the *lazarettos*, built on spaces adjacent to the harbours, with an architecture similar to that of the prisons, guaranteeing the confinement of suspected or sick individuals. The officials were the *health providers* who intervened in the organisation of quarantines and lazarettos, in the process of reporting the dead or sick, in the control of urban hygiene, in the procedures for burying the corpses. In turn, the *consuls* were the official representatives of the States who were responsible for the health surveillance of the crews and goods.

Regarding quarantine health regulations, they had the *duration of forty days*, according to the Hippocratic doctrine that considered the fortieth day as the last possible day in the development of acute diseases such as the plague. The *patents* were medical-administrative documents that aimed to

collect information on the health situation of harbours of origin of ships, passengers and goods.

In terms of the centralisation of health measures, the responsibility for organising these measures was transferred, throughout the 17th century, from the local authorities to the States. Quarantine, with its local variants and selective duration, was not just a reference for the duration, but a generic term (Mafart & Perret, 1998). Quarantine represents the archetypal conflict that shapes collective health management: the tension between society's dual interest in safeguarding individual freedom while protecting and promoting the health of its citizens (Ries, 2005).

The goods carried by the vessels were considered dangerous elements that should be controlled by the harbour health authorities. The contagious component of the disease was supposed to be absorbed by the bodies and porous substances. The materials that could absorb the disease were wool, animal hair, mane, fur, hides, feathers, cotton, flax, hemp, silk and all objects made of these materials, such as baskets, boxes and ropes, among others. Paper, books and manuscripts, candles, live and dead animals were considered infectious elements. The metals and objects made of metal, precious stones, grains, flour, meat, vegetables, fruits and nuts, wine, oil and vinegar, drugs and aromatic substances were considered non-infectious (Bonastra, 2006). The exposure of wool, silk or flax loads to sunlight, air, fumigation of perfumed substances and the immersion of silver and precious stones in vinegar was favoured.

The old lazaretto and new lazaretto sanitary institutions, as temporary spaces of preventive isolation, originated in Venice in 1423 and 1468, respectively. The old lazaretto was characterised by being a place of piety, in which assistance was provided by religious agents who had attained some empirical knowledge in providing care to leprosy patients. The new lazaretto was a place of control where, in some aspects, the admission and distribution procedures in use in the hospital were present: the admission in the quarantine of suspect cases and the sending to the old lazaretto of those who were considered contaminated and dangerous (Cosmancini, 1992; Viallon, 2008).

These health institutions separated individuals between «infected» and «suspects». The «infected» subjects had a contagious disease, diagnosed by a doctor or surgeon. The «suspect» individuals were all those who had been in contact with a person or objects considered infected, as well as all people from a supposedly pestilent space (Cipolla, 1992). The lazaretto was a closed space, created for a temporary and transitional period. It was a space of segregation for individuals classified as contagious and dangerous (albeit the patients were not deemed irrecoverable) based on a logic of preventive confinement (Cosmacini, 1992).

The construction of the lazarettos followed several morphological guidelines. One primary instruction was isolation from the outside. Being a sanitary device whose purpose was to prevent the spread of epidemics through isolation, for a given time, of passengers and goods before they could enter a city, the quarantine space, located in an area contiguous to the city, would have to be closed, like a fortress, where the watchtowers and the moat around the building reinforced the fortification aspect. Any contact between the inside and the outside would thus be unlikely, preventing the spread of the disease. Another directive concerned the segregation and purification of people and goods. It was important that premature and strict segregation of people and goods was applied inside the lazaretto, given the belief that both could infect each other. The quarantine system was based on the assumption that all travellers were potential carriers of the plague. Thus, it was imperative to avoid mixing passengers with different degrees of danger, such as those in different stages of quarantine, inasmuch that they were likely to cause undesirable infections and the same thing could occur with the levels of separation and compartmentalisation of goods (Bonastra, 2010).

If quarantines, lazarettos and disinfection measures were promises of a better future, for many, protecting themselves from the epidemic was simply a matter of escape. Many people left their affected cities, according to medical precepts, to take refuge in places they expected to be more forgiving. Unfortunately, this only contributed to the spread of the disease. As for isolation, while it could limit inter-human contamination, it was relatively ineffective because rats and fleas were widespread globally and their role in epidemics was completely ignored by contemporaries. After the last great plague epidemics, the lazarettos gradually fell into disuse until the 19th century. Then, the occurrence

of new contagious diseases, introduced, in particular, by ships from tropical areas, led to the reopening of lazarettos throughout Europe.

The collective challenges posed by the «management» of the plague, imbricated to circumstantial coalitions of interests, led to the definition and implementation of health policies, the promotion and development of new devices (isolation, quarantines, lazarettos and cordons sanitaires), and shaped the process of «collective management» of epidemic diseases. In this process, several components were relevant, namely, the personalisation of the scourge, of religious inspiration, enabling the establishment of a relationship between the movement of people and the development of epidemics; the institutionalisation of sanitary confinement materialised in the construction of specific buildings and the adoption of coercive regulations implemented by authorised representatives; the process of centralising sanitary measures and their scientific legitimisation, allowing the responsibility for the organisation of these measures to be transferred, from the 17th century onwards, from local authorities to the States, interwoven with a process that articulated medicalisation and internationalisation of the health debate on epidemics (Mafart & Perret, 1998; Logie & Turan, 2020; Sharma, 2020; Mordechai et al., 2019).

5. Conclusion

This article aimed to understand the multiple collective challenges posed by plague epidemics. The analysis of these challenges can contribute to the reflection on several dimensions that shape the COVID-19 pandemic crisis, a health and societal crisis inscribed in what is not a crisis – always temporary – but rather the expression of the risks of modernisation and globalisation, and of a lasting and irreversible ecological transformation (Latour, 2020; Santos, 2020).

Pestis continued to shape material conditions of existence, mortality crises and the system of symbolic representations of epidemics and pandemics. The COVID-19 pandemic is not an unprecedented phenomenon. It is part of a process of emergence and re-emergence of epidemics over centuries, which, in recent decades, has presented many severe episodes. Among these epidemics, H5N1 influenza in 1997 and 2005, SARS in 2003, H1N1 in 2009, MERS in 2012, and the Ebola epidemic from 2014 onwards stand out. The genesis and various impacts of the COVID-19 pandemic have posed multiple and complex scientific, moral, social and political challenges to the different agents, which will continue in the post-COVID period. This pandemic, like any other epidemic, is a health threat that can be characterised by uncertainty, impotence, dystopia and fear of the other.

5.1 Uncertainty

Uncertainty is one of the central components that characterise a health threat. The situation of uncertainty cannot be assessed in terms of rational calculation. Two types of uncertainties can be stated: «severe» uncertainties determined by ignorance, in which uncertainties, despite being present, cannot be identified; and «epistemic» uncertainties, which, being the result of incomplete knowledge, can be resolved through further and fruitful research.

Human knowledge on this pandemic phenomenon, in several areas, continues to be dominated by ignorance, whether about the origin of the virus, its progression or its future developments. Among the «known unknowns» (O'Connor et al., 2020, p. 2), which have been reshaping over this past year, are several key epidemiological questions, such as the actual prevalence of the virus in populations, the role of asymptomatic cases and new strains in the rapid spread of the virus, the degree of immunity acquired by individuals after infection, the main routes of exposure and infection, and likely seasonal outbreaks of the disease in the future (O'Connor et al., 2020). At the societal level, the «known unknowns» have been equally disturbing. Among these are the uncertainty associated with the possibility of safe and effective vaccines or other medicines being produced and made available on a global scale, and the insecurity that sets in when variants of the virus are identified. The limitations and vulnerabilities of health systems in a public health emergency – although universal public health

systems are critical in these processes – emerge in a particularly acute way when the collapse scenario becomes a possibility, with unequally distributed consequences (Nunes & Serapioni, 2020). These collapse scenarios, expressed in various epidemiological models and statistical projections, are the dark pole of the scenarios developed by various disease control and prevention centres in different countries, which present very different values regarding the number of people infected or dead, depending on the conjectures made in terms of contagion or severity: some scenarios place the number of deaths in the USA alone between 200,000 and 1,7 million (Fassin, 2020).

One of the uncertainties present in these health threats is the one inherent in the perceptions, representations and practices developed by individuals, which the public authorities are often unaware of, and which is, yet, crucial. Risk attitudes, which experts or public authorities often tend to consider irrational, are justified by individuals for facing a health threat risk competing with a health risk (Peretti-Watel & Châteauneuf-Malclès, 2020). Currently, some people are willing to expose themselves to the risk of being infected with coronavirus by not complying with the containment measures because the immediate competing risks weigh more: they risk losing their job, income, not being able to complete a project, they fear loneliness, just to name a few. In health threats like the one the world is experiencing, poorer, more precarious and isolated people are more exposed and feel more vulnerable to risk (Peretti-Watel & Châteauneuf-Malclès, 2020).

The uncertainty about the evolution of the pandemic and the ability of the economy, work and society to recover, the prediction that a new wave will arise again in a time for which science will not yet have an effective medical response, and the fear of a future, which seems to be increasingly uncertain and marked by threats and disasters on a large scale, generate a sense of fear and subsequent withdrawal, blockage and hopelessness (Sotero & Alarcão, 2020). The oscillations between denial and fear, between minimising the epidemic and maximising the response, are indications of the vulnerability of societies faced with a phenomenon of such magnitude.

5.2 *Impotence*

The realisation that a novel coronavirus would be the cause of a potentially serious acute respiratory infection, characterised by having a mode of inter-human transmission, giving rise to an exponential number of infections, deaths and affected countries, led to the declaration by WHO of COVID-19 as a pandemic on March 11, 2020, with some 118,000 cases, 4,291 deaths and 114 countries affected at the time of the declaration.

Powerlessness in the face of this public health emergency, inherent in the non-existence of a treatment or vaccine – which began to be administered in the United Kingdom in December 2020 – reduced public intervention to the implementation of measures that were not very different from those used in the 14th century, at the time of the Black Death in Europe: the sick were isolated, people's activity and mobility were reduced, and even cordons sanitaires were established around contaminated areas (Fassin, 2020). The aim was to enhance the ability to contain the situation through measures, based on surveillance, case tracking, testing, hygiene and personal protection measures and isolation. To slow down the coronavirus spread, priority was given to the use of quarantine and lockdown of territories and the populations living there, with the resulting social, economic and political consequences (Nunes & Serapioni, 2020).

Another sign of this impotence is the inability and incompetence of some governments to protect people's lives. These governments created a «fatal equation between economy and life» and argued that the economy would be more important than life, so they were reluctant to increase containment measures, neglecting the severity of the pandemic. This delay resulted in thousands of deaths (Santos, 2021). As Beck states, due to the impact of global risks, States are more authoritarian but inefficient when it comes to dealing with different global threats and dangers, becoming «strong failed states» (Beck, 2008, p. 79). However, the State is the ultimate guarantor of the value of people's goods and lives. The State thus takes on a central role in a time when risks are mostly global in nature (Beck, 2008; Mendes, 2015).

This powerlessness has led to the systematic use of the rhetoric of war, particularly by the media

and policymakers. The idea of war is used as a signifier of urgency, on the one hand, with the aim of intensifying the mobilisation of means and resources, and, on the other, of gravity, appealing to the order, discipline and obedience of the population (Pereira, Giuliani, Santos, & Roque, 2020).

5.3 *Dystopia and Fear of the Other*

The COVID-19 pandemic exposed the fragilities of an economy that maintains a destructive relationship with the environment (Coelho, 2020; Latour, 2020). It potentiated an unprecedented recession caused by conflicting and even destructive society-environment-economy interactions (Coelho, 2020; Latour, 2020). It has given rise to a severe economic crisis in a short period of time. The confinement of a high percentage of the world population led to the suspension of activity in numerous economic sectors. Unemployment increased significantly.

This disruptive situation expresses a dystopia (Claeys, 2017; Bebian, 2020), a place of suffering and desolation, determined by a transformation of nature conditioned by bad choices of human intervention, an imaginary place where individuals live under extreme conditions of oppression, despair and conflict (Bebiano, 2020). The dystopian configuration of contemporary and future societies may be accentuated with this pandemic. Aspects such as the imposition of social distancing, the restraint imposed on collective events, the recording of citizens and their private lives, the citizens as watchdogs of themselves and their neighbours, the compulsory mask-wearing in public spaces, the systematic execution of tests to identify the infected and to check immunity, the disinfection of hands, the control of temperature, the control of dwelling places, the abrupt return of country borders, the limitation of human movement and presence in public places, the detailed and regular recording of health conditions, the establishment of hyper-surveillance on people, the digital tracking of contacts, the massive collection of biological samples, the mandatory extension of the remote working regime, the digital control of individual activity, the total flexibility of unemployment, the very limitation of the freedom of assembly and protest, as well as the more assertive intervention of the State, the law and the police mechanisms, announce, in the name of the necessary health security, a normality dominated by numerous restrictions (Bebiano, 2020; Santos, 2020; Santos & Costa, 2020; Gomes, 2020). Prudential socialisation has created in the last 25 years the mentality propitious to the conformation with the measures of confinement in the wake of the COVID-19 pandemic, which, in many cases, anticipated the State decisions of exception, representative of sanitary authoritarianism, ascribing specialists a reinforced power (Gomes, 2020).

The perception of great danger underlies the contagion-epidemic dyad, amplified in contemporary societies by the extreme speed of the circulation of people, goods and information. The belief in the association between contagion and danger intrinsic to epidemic diseases, namely the COVID-19 health threat, has reinforced fears, prejudice and enhanced stigma and xenophobia, reproducing a social image of the dangerousness of the disease, «impure» patients, potential patients and the regions and countries associated with the genesis of the disease. The epidemic is categorised as an attribution inherent in the invasion of the «strange», the «foreign», the «other», reinforcing distances and social hierarchies (Ferreira & Serpa, 2020; Logie & Turan, 2020). In the current pandemic situation, one of the facets of the salutogenic discourse focuses on the body contamination metaphor, intensifying susceptibility and aversion to bodily degradation. The sick, the old, the contaminated and those with bodily marks of physical decay tend to be excluded or ignored (Gomes, 2020).

This process of stigmatisation of the «other» is interwoven with one of the sharpest challenges individuals face in this and other probable epidemic threats: to understand to what extent the morality of our actions is determined by the value of their consequences. Dilemmas such as allowing a significant part of the population of a given country to contract the disease to develop collective immunity to prevent future epidemic outbreaks, or deciding who deserves to die or live in a context of a relative scarcity of resources (beds, masks, ventilators, etc.) are moral problems that confront the agents responsible for the medical and political «management» of the disease and, above all, that confront all of us!

6. Acknowledgement / Funding

This work was financed by national funds through FCT - Foundation for Science and Technology, I.P., within the scope of the project «UIDB 04647/2020» of CICS.NOVA–Centro Interdisciplinar de Ciências Sociais da Universidade Nova de Lisboa.

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